19 in which a program routine is stored. When, in the following, it is described that the computer operates, it is to be understood that the computer is directed by the program in memory 19. The memory 19 may be a ROM circuit or a hard disc. The program may be supplied to the memory 19 from a non-volatile memory such as a

5   CD-ROM or a diskette, e.g. via a databus (not shown). The computer has access to calibration data in a ROM unit 16 and calculates the amount of structure-modifying agents that must be added to the melt. This amount is signalled to a means 18 for administrating structure-modifying agent to the melt 20 to be corrected, whereby the melt is supplied with an appropriate amount of such agents.

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<u>Claims</u> . _

1. A process for determining the amount of structure-modifying agent that has to be
added to a certain cast iron melt in order to obtain compacted graphite cast iron or

5   spheroidal graphite cast iron from a molten cast iron having an hypo-eutectic or
close to eutectic composition, which method requires a sampling device comprising
a sample vessel, means for monitoring temperature as a function of time both in the
centre and close to the wall of said sample vessel, and a means for administrating
structure-modifying agents to the molten cast iron, the method comprising the steps

10   of:

a) for the chosen casting method calibrating the amount of structure-modifying
agent that has to be added to a hypo-eutectic melt in order to obtain compacted
graphite cast iron or spheroidal graphite cast iron as a function of the maximum

15   value α of the first time derivative of a cooling curve recorded in the centre of a
sample vessel;

b) taking a sample of the molten cast iron by using a sampling device;

20   c) allowing said sample to solidify in a sample vessel, and during the solidification
recording cooling curves in the centre of the sample vessel and at the sample vessel
wall, respectively;

d) determining a heat generation curve disclosing the heat generated in the centre of

25   the sample as a function of time by applying

i) the thermal balance formula:

$Q_{stored} = Q_{generated} + Q_{in} - Q_{out}$

where Q_{stored} is the amount of heat stored by the heat capacity of the
material, $Q_{generated}$ is the amount of heat generated by the volume of

material, Q_{in} is the heat transferred into the material from its surround-

ings and Q_{out} is the heat transferred to the surroundings; and

ii) the cooling curves recorded in step c);

5 e) identifying the location of a possible local maximum t_p on the heat generation curve obtained in step d), which maximum corresponds to an austenite formation point on the centrally recorded cooling curve obtained in step c), and controlling whether there is a risk that this austenite formation point affects the value of the maximum slope of the centrally recorded cooling curve; and

10 f) if a t_p has been located, and if there is no risk that the maximum first time deriva-tive value α is affected by austenite formation, calculating the amount of struc-ture-modifying agent (Va) that has to be added to the melt by using the value α and the calibration data obtained in step a); or

15 g) if a t_p has been located, and if $t_p - t_\alpha$ is less than a threshold value t_{tv}, identifying a time, $t_{\alpha 1}$, $(t_{\alpha 1} > t_\alpha)$ for which the second time derivative of the centrally recorded cooling curve is approximately 0, determining the first time derivative value α_1, and calculating the amount of structure-modifying agent (Va) that has to be added to the

20 melt by using the value α_1 and the calibration data obtained in step a).

2. A process according to claim 1, **characterised** in that the amount of structure-modifying agent that has to be added to a certain cast iron melt in order to obtain compacted graphite cast iron is determined.

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3. A process according to claim 1 or claim 2, **characterised** in that the heat trans-port in a sample vessel containing molten cast iron is approximately the same in all directions.